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(54) VIDEO ON DEMAND DEVICE

(57)Abstract:

PURPOSE: To temporarily stop reproducing in the middle of execution of the video, on demand to easily recognize contents of a program after the restart of reproducing, to prevent a line from being occupied, and to prevent unncessary charging.

CONSTITUTION: When the telephone function or the like is executed in the middle of execution of the video on demand, an interactive TV device 12 sends a program temporary stop signal to a center sender 11 to temporarily stop reproducing. Then, a user is prevented from being unable to view a part of the program by the telephone function. After the end of the telephone function, a program temporary stop release signal is sent to the center sender 11. The center sender 11 restarts reproducing after rewinding for a prescribed time from the stop position. The temporary stop time and the power-off state during execution of the video on demand are monitored by a temporary stop time monitor timer 13 and a power-off monitor circuit 14 to give an alarm.

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CLAIMS

[Claim(s)]
[Claim 1] By controlling playback of the video signal of two or more programs, the center sending-out means which can send out the video signal of two or more of said programs, While receiving supply of the video signal of the predetermined program of said two or more programs by connecting with said center sending-out means through a communication line, having a video-on-demand function, and requiring a video on demand of said center sending-out means Video-on-demand equipment characterized by providing a terminal means to make playback of the video signal of

said predetermined program which has received supply by sending out a program halt signal to said center sending-out means suspend.

[Claim 2] Said center sending-out means is video-on-demand equipment according to claim 1 characterized by providing the video server which can output the video signal of two or more programs, and the center sending-out equipment which controls playback and a halt of this video server.

[Claim 3] Said terminal means is video-on-demand equipment according to claim 1 characterized by sending out said program halt signal when it has other at least one or more functions besides said video-on-demand function and performs other functions during activation of said video-on-demand function.

[Claim 4] Said terminal means is video-on-demand equipment according to claim 3 characterized by making playback of the video signal of said predetermined program resume by sending out a program halt discharge signal to said center sending-out means after activation termination of a function besides the above.

[Claim 5] Said center sending-out means is video-on-demand equipment to a publication in claim 4 characterized by returning to the location in front of predetermined time from the location which suspended playback, and making playback resume with said program halt signal, when said program halt discharge signal is inputted.

[Claim 6] Said terminal means is video-on-demand equipment according to claim 1 characterized by generating predetermined warning when the time amount which had a monitor means to supervise halt time amount, and playback has halted with said program halt signal exceeds predetermined time.

[Claim 7] Said terminal means is video-on-demand equipment according to claim 1 characterized by generating predetermined warning, when power-source OFF is required in the condition that had a detection means to detect that power-source OFF was required, and playback has stopped with said program halt signal.

[Claim 8] Said predetermined warning is claim 6 characterized by carrying out by indicating the alarm display by onscreen one on a predetermined screen, or video-on-demand equipment of any one publication of seven.

ETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001] [Objects of the Invention]

[Industrial Application] This invention relates to the video-on-demand equipment adopted in cable television etc.

[0002]

[Description of the Prior Art] Conventionally, cable television (henceforth a CATV system) has spread and multiple-purpose service using communication facility besides image broadcast services, such as retransmission-of-message service and independence broadcast service, is offered. Namely, in a CATV system, request service to pin center,large equipment from terminal units, such as a viewing-and-listening application of the communication link of notice service, recovery of charged broadcast viewing-and-listening account data, a program audience rating survey, etc. or catalog shopping, and a pay program, etc. can be offered now by making possible two-way communication of pin center,large equipment and a terminal unit group.

[0003] Interactive television (TV) equipment equipped with interactive service is developed by having CPU and its control software in recent years. This interactive TV equipment can be used for the two-way communication of a CATV system. For example, sending out of video software can also be required of the center of a CATV system by using the interactive service of interactive TV equipment. If such a video-on-demand function is used, moreover, desired video software can be appreciated on real time like the case where rental video software is rented, without each user possessing video software.

[0004] Drawing 11 is the block diagram showing the conventional video-on-demand equipment which constituted the CATV system using such interactive TV equipment.

[0005] It gets down and the downstream signals (broadcast signal etc.) transmitted from center sending-out equipment 1 are transmitted to interactive TV equipment 2 through Rhine. Moreover, the upstream signals (various commands etc.) from interactive TV equipment 2 are transmitted to center sending-out equipment 1 through uphill Rhine.

[0006] The telephone receiver 3 and the network control unit (henceforth NCU) 4 are connected to interactive TV equipment 2, and interactive TV equipment 2 has a telephone function. Furthermore, interactive TV equipment 2 has a video-on-demand function, a ticket reservation function, a race card display function, etc. which were mentioned above besides the reception function to receive the usual broadcast signal.

[0007] Actuation control of the interactive TV equipment 2 is carried out by remote control equipment (henceforth a remote control unit) 5. The remote control unit 5 has keys which are not illustrated, such as a power-source key, a channel key, a sound-volume key, and a numerical keypad, and it changes into infrared light the code generated based on a user's key stroke, and it carries out outgoing radiation to

interactive TV equipment 2. By decoding the infrared light which received, interactive TV equipment 2 performs control based on a user's key stroke. Moreover, as for the remote control unit 5, the function as a telephone transmitter is also added.

[0008] For example, a user shall operate a remote control unit 5 and shall perform a video-on-demand function. Interactive TV equipment 2 receives and decodes the infrared light from a remote control unit 5, and if it detects that the video-on-demand function was specified, a video on demand will be required of pin center,large sending-out equipment 1.

[0009] Pin center,large sending-out equipment 1 gets down from the program information on the video software supplied from a video server 6, and is sent out to interactive TV equipment 2 through Rhine. Thereby, the title of two or more video software which can be supplied is displayed on the display screen of interactive TV equipment 2. A user specifies desired video software by the numerical keypad, looking at the title display on a display screen.

[0010] Interactive TV equipment 2 outputs the upstream signal for choosing video software to pin center,large sending-out equipment 1. The video signal of the video software specified from the video server 6 is supplied, and pin center,large sending-out equipment 1 gets down, and is outputted to interactive TV equipment 2 through Rhine. Thereby, on the display screen of interactive TV equipment 2, it projects the image of video software.

[0011] By the way, as mentioned above, interactive TV equipment 2 has the ticket reservation function, the telephone function, etc. besides the video-on-demand function, and is available also during video-on-demand activation in these functions. Drawing 12 is a flow chart which shows the flow of operation in this case.

[0012] Now, a telephone function shall be used during activation of a video-on-demand function. Step S1 of drawing 12 Setting, a user operates the predetermined key of a remote control unit 5, and displays a functional call menu on the display screen of interactive TV equipment 2. In this case, interactive TV equipment 2 makes projecting of the image of the video software by the video-on-demand function halt in consideration of using a display screen by functions other than a video-on-demand function.

[0013] Next, a user chooses the telephone function in a functional call menu using a remote control unit 5. If it does so, interactive TV equipment 2 directs connection with the telephone line which does not control and illustrate NCU4 while activating a telephone receiver 3, using a remote control unit 5 as a telephone transmitter. Thereby, interactive TV equipment realizes a telephone function. if activation of a telephone function is ended -- step S1 of drawing 12 from -- it returns to a video-on-demand function.

[0014] However, if other functions are performed during video-on-demand functional activation as mentioned above, the graphic display of video software will be turned off.

On the other hand, center sending-out equipment 1 is continuing sending out of a video signal. For this reason, it cannot view and listen to the image of the broadcast video software until it ends use of a telephone function and returns to a video-on-demand function.

[0015] Moreover, it gets down irrespective of the existence of activation of other functions during activation of a video-on-demand function, and Rhine continues being used for transmission of the video signal of video software. For this reason, it cannot get down to other processings and Rhine cannot be used. Moreover, in a CATV system, generally it gets down, and Rhine was branched, pin center,large sending-out equipment 1 and two or more terminals are connected, it gets down by the video-on-demand function which is not used, Rhine is occupied, and the problem of being bad also has service effectiveness.

[0016] Furthermore, after the user has forgotten that it is [of a video-on-demand function] under activation and ended use of other functions, the problem that the power source of interactive TV equipment 2 might be turned OFF was.

[0017]

[Problem(s) to be Solved by the Invention] Thus, in the conventional video-on-demand equipment mentioned above, when other functions were performed during video-on-demand functional activation, there was a trouble that it could not view and listen to a part of broadcast program. Moreover, even when making activation of a video-on-demand function suspend, it got down, Rhine will be occupied and the trouble of being bad also had service effectiveness. Furthermore, the user has forgotten for a video-on-demand function to perform, and there was also a trouble that a power source might be turned OFF after ending use of other functions.

[0018] Even when this invention is made in view of this trouble and other functions are used during activation of a video-on-demand function, it aims at offering the video-on-demand equipment which can view and listen to all of video software.

[0019] Moreover, this invention aims at offering the video-on-demand equipment which can make grasp of a program easy by resuming playback from before a halt location after activation halt termination of a video-on-demand function.

[0020] Moreover, this invention aims at offering the video-on-demand equipment which can prevent turning OFF a power source accidentally after halt termination while it gets down and it controls occupancy of Rhine by warning, when activation of a video-on-demand function has stopped for a long time.

[0021] [Elements of the Invention]

[Means for Solving the Problem] The video-on-demand equipment concerning this invention by controlling playback of the video signal of two or more programs The center sending-out means which can send out the video signal of two or more of said programs, While receiving supply of the video signal of the predetermined program of said two or more programs by connecting with said center sending-out means through

a communication line, having a video-on-demand function, and requiring a video on demand of said center sending-out means A terminal means to make playback of the video signal of said predetermined program which has received supply suspend is provided by sending out a program halt signal to said center sending-out means.

[0022]

[Function] In this invention, a center sending-out means sends out the video signal of the program chosen by the terminal means among two or more programs to a terminal means. A terminal means sends out a program halt signal to a center sending-out means, when performing other functions during video-on-demand functional activation. Thereby, a selection sending-out means makes playback of the video signal of the program currently supplied to the terminal means suspend.

[0023]

[Example] Hereafter, the example of this invention is explained with reference to a drawing. Drawing 1 is the block diagram showing one example of the video-on-demand equipment concerning this invention.

[0024] Going-up [which transmits a downstream signal] Rhine which transmits Rhine and an upstream signal by getting down connects between center sending-out equipment 11 and interactive TV equipment 12. Center sending-out equipment 11 is connected to the video server 6. A video server 6 is digital one or an analog configuration, and can supply now two or more video software to center sending-out equipment 11.

[0025] Center sending-out equipment 11 can make a video server 6 suspend playback of video software in this example, if the program halt signal from interactive TV equipment 12 is supplied. For example, if a video server 6 shall be a digital configuration, center sending-out equipment 11 will suspend playback by repeating the same address and accessing it. Moreover, center sending-out equipment 11 makes playback of a video server 6 resume with the program halt discharge signal from interactive TV equipment 12. In this case, center sending-out equipment 11 makes a front location to playback resume [predetermined time] from the playback halt location of a video server 6.

[0026] Interactive TV equipment 12 is controlled by the remote control unit 5. The remote control unit 5 has keys which are not illustrated, such as a power-source key, a channel key, a sound-volume key, and a numerical keypad, and it changes into infrared light the code generated based on a user's key stroke, and it carries out outgoing radiation to interactive TV equipment 12 as a remote control signal. Furthermore, the remote control unit 5 also has the function as a telephone transmitter, and can be transmitted now to interactive TV equipment 12 through the antenna which does not modulate and illustrate a user's voice.

[0027] A telephone receiver 3 and NCU4 are connected to interactive TV equipment 12. NCU4 is controlled by interactive TV equipment 12, and connects with the

telephone line which does not illustrate interactive TV equipment 12. A telephone receiver 3 is controlled by interactive TV equipment 12, becomes active, and carries out a voice output from the loudspeaker which does not restore to it and illustrate the signal inputted through NCU4 and interactive TV equipment 12.

[0028] Interactive TV equipment 12 has CPU which is not illustrated and its control software, and has the video-on-demand function, the ticket reservation function, the race card display function, etc. besides the reception function to receive the broadcast signal from center sending-out equipment 11, and the telephone function. Interactive TV equipment 12 sends out a program halt discharge signal after activation termination of other functions while it can perform other functions and sends out a program halt signal to center sending-out equipment 11 in this case during video-on-demand functional activation.

[0029] Furthermore, in this example, the halt time amount watch-dog timer 13 and the power-source OFF supervisory circuit 14 are formed. If a program halt signal is sent out to center sending-out equipment 11 from interactive TV equipment 12, the halt time amount watch-dog timer 13 will become active, and will count the halt time amount of program playback. The halt time amount watch-dog timer 13 is counted up when counted value reaches a predetermined value, and it outputs a time-out signal to interactive TV equipment 12. Interactive TV equipment 12 will display warning which shows that a program is in a long duration halt condition on the display screen 15, if a time-out signal is inputted.

[0030] Interactive TV equipment 12 can turn OFF a power source by activating power-source OFF demand Rhine which is not illustrated. Power-source off demand Rhine is connected to the power-source off supervisory circuit 14 through the sensing line. The power-source off supervisory circuit 14 will output a power-source off alarm signal to interactive TV equipment 12, if it detects that became active when the program halt signal was sent out to center sending-out equipment 11 from interactive TV equipment 12, and power-source off demand Rhine became active by the sensing line. Interactive TV equipment 12 will display warning which shows that it is going to turn off the power source during a halt of a video-on-demand function on the display screen 15, if a power-source off alarm signal is inputted.

[0031] Next, actuation of the example constituted in this way is explained with reference to drawing 2 thru/or drawing 10 . Drawing 2 is a flow chart which shows the flow of interactive TV equipment 12 of operation, and drawing 3 is a flow chart which shows the flow of center sending-out equipment 11 of operation.

[0032] Now, a viewer shall operate the menu screen key which a remote control unit 5 does not illustrate, and shall display a main menu screen. Drawing 4 is the explanatory view showing this main menu screen. On the display screen 15 of interactive TV equipment 12, the main menu screen 21 shown in drawing 4 is displayed. It is shown by drawing 4 that interactive TV equipment 12 has the video-on-demand function, the

telephone function, the ticket reservation function, and the race card display function.

[0033] Here, a viewer shall operate "1" of the numerical keypad which a remote control unit 5 does not illustrate in order to perform a video-on-demand function. The remote control signal of the infrared light from a remote control unit 5 is received and decoded in interactive TV equipment 12. Thereby, interactive TV equipment 12 performs a video-on-demand function. That is, interactive TV equipment 12 requires a video on demand of center sending-out equipment 11 through uphill Rhine first.

[0034] According to the demand of this video on demand, pin center,large sending-out equipment 11 gets down from the program information on the video software supplied from a video server 6, and is sent out to interactive TV equipment 12 through Rhine. Interactive TV equipment 12 is displayed on the display screen 15 by using this program information as the video-on-demand selection screen 22. Drawing 5 is the explanatory view showing the display in this case. It is shown by drawing 5 that the soccer of Movie A, Movie B, and C opposite D and today's news highlights can be offered as a program.

[0035] For example, in wishing viewing and listening of Movie B, a viewer does depression actuation of the numerical keypad "2" of a remote control unit 5. This transmits the signal which shows that interactive TV equipment 12 chose Movie B to center sending-out equipment 11. Center sending-out equipment 11 controls a video server 6, and supplies the video signal of the selected program to interactive TV equipment 12 through read-out and going-down Rhine. In this way, it projects Movie B on the display screen 15.

[0036] Here, a viewer shall use a telephone function. A viewer operates the menu screen key of a remote control unit 5, and displays the main menu screen 21. Subsequently, a viewer operates a numerical keypad "2" and chooses a telephone function. On the other hand, interactive TV equipment 12 judges whether other functions were required during video-on-demand functional activation in step S11 of drawing 2 . If a telephone function is required, interactive TV equipment 12 shifts processing to step S12 from step S11, and sends out a program halt signal to center sending-out equipment 11. Thereby, a halt of the program of Movie B is required.

[0037] If it does so, center sending-out equipment 11 detects that a program halt was required in step S21 of drawing 3 , and directs a halt of program sending out to a video server 6 in the following step S22. Thereby, a video server 6 suspends playback of the movie B after the time of a telephone function being required.

[0038] On the other hand, with the remote control signal from a remote control unit 5, if it detects that the telephone function was required, it shifts to step S13, and interactive TV equipment 12 will activate a telephone receiver 3 while making it connect with the telephone line through NCU4, and will display a telephone screen on the display screen 15 further. Drawing 6 is the explanatory view showing the display in this case. The telephone screen 23 has the telephone directory display 24 which

shows the partner by whom the telephone number is registered. It is shown by drawing 6 that the four telephone numbers, a house, friend's house A, friend's house B, and a firm, are registered by the telephone directory display 24.

[0039] Here, the numerical keypad "2" of a remote control unit 5 shall be operated, and friend's house A shall be telephoned. Interactive TV equipment 12 has memorized the number to be dialed of friend's house A in the memory which is not illustrated, generates the dial signal based on this number to be dialed, and sends it out to the telephone line through NCU4. If a circuit with friend's house A is opened for traffic, interactive TV equipment 12 will output the signal from the remote control unit 5 which is a telephone transmitter through NCU4 while supplying and carrying out the voice output of the transmitted signal to a telephone receiver 3. In this way, the telephone function using interactive TV equipment 12 is realized.

[0040] Interactive TV equipment 12 judges whether use of a telephone function was completed in step S14 of drawing 2 . When a viewer sets a remote control unit 5 as a condition on hook, a telephone function is completed and processing shifts to step S15. At step S15, interactive TV equipment 12 outputs a program halt discharge signal to center sending-out equipment 11.

[0041] On the other hand, center sending-out equipment 11 judges whether discharge of a program halt was required in step S23 of drawing 3 . Center sending-out equipment 11 will carry out predetermined time rewinding of the program in the following step S24, if it detects that the program halt discharge signal was inputted. That is, center sending-out equipment 11 is returned to the playback location in front of predetermined time from the playback location at the time of controlling a video server 6 and halting, and resumes read-out (step S25).

[0042] The video signal of the movie B from a video server 6 is supplied to interactive TV equipment 12 through center sending-out equipment 11. In this way, on the display screen 15 of interactive TV equipment 12, it projects from the location in front of the predetermined time of the playback location which the program of Movie B halted. Thereby, a viewer can see a continuation of a program, remembering expansion of a story.

[0043] Furthermore, the timer-supervision routine shown in sending out and coincidence of a program halt signal at drawing 7 is also performing interactive TV equipment 12. If a program halt signal is sent out, processing will be shifted to step S32 from step S31. At step S32, it judges whether the time amount of a halt of a program exceeded predetermined time. The halt time amount watch-dog timer 13 has counted the elapsed time from the sending-out point in time of a program halt signal, and if it counts up, it will output a time-out signal. If a program halt discharge signal is outputted before count-up, it will return to step S31 from step S32, and processing will be returned.

[0044] If the halt time amount watch-dog timer 13 counts up and a time-out signal is

outputted, interactive TV equipment 12 will perform an alarm display in the following step S33. Drawing 9 is the explanatory view showing a screen display in this case. As shown in drawing 9 , it is shown by the alarm display 25 that the video-on-demand function is in a prolonged halt condition. Moreover, it is also shown that it can choose whether a halt is made to continue, a video-on-demand function is stopped by the alarm display 25, or a program is made to continue, and it views and listens.

[0045] For example, when a viewer does depression actuation of the numerical keypad "1" of a remote control unit 5, interactive TV equipment 12 makes a halt of a program continue. Moreover, if the numerical keypad "2" of a remote control unit 5 is operated, interactive TV equipment 12 will send out the deactivate request of a video on demand to center sending-out equipment 11, and will stop a video-on-demand function. Furthermore, if the numerical keypad "3" of a remote control unit 5 is operated, interactive TV equipment 12 will stop other functions other than a video on demand, will send out a program halt discharge signal to center sending-out equipment 11, and will carry out continuation viewing and listening of the program.

[0046] Moreover, the power-source OFF executive routine shown in sending out and coincidence of a program halt signal at drawing 8 is also performing interactive TV equipment 12. If a program halt signal is sent out, it will judge whether power-source OFF was required in step S35 of drawing 8 .

[0047] After a viewer uses a telephone function during video-on-demand functional activation and ends use of a telephone function now, a power-source key shall be operated accidentally and a power source shall be turned OFF. In this case, in step S35, the power-source off supervisory circuit 14 detects that power-source off demand Rhine became active through the sensing line, and outputs a power-source off alarm signal to interactive TV equipment 12.

[0048] If a power-source off alarm signal is inputted, interactive TV equipment 12 performs an alarm display in step S37, and it will return processing, without turning off a power source in step S38. Drawing 10 is the explanatory view showing the alarm display 26 of power-source OFF. By drawing 10 , when power-source OFF is required, it is shown that the program by the video on demand is in a halt condition. Moreover, it is also shown that it can choose whether a halt is made to continue, a video-on-demand function is stopped by the alarm display 26, or a program is made to continue, and it views and listens like the alarm display 25 of a halt. By seeing this alarm display 25, it can prevent that a viewer turns OFF a power source accidentally during video-on-demand functional activation, and being charged vainly is prevented.

[0049] Thus, after outputting a program halt signal to center sending-out equipment 11, making playback of a program suspend and completing other functions, you output a program halt discharge signal and are making it resume playback of a program in this example, in performing other functions during activation of a video-on-demand function. Thereby, it can view and listen to all the programs. And only predetermined

time is making a front location to playback resume from the playback location at the time of a halt, a viewer can check expansion of a story and it becomes easy to grasp [of the contents of a program] center sending-out equipment 11.

[0050] Moreover, the halt time amount watch-dog timer 13 warns, when halt time amount becomes long. It is warned to a viewer of long duration occupancy being carried out without getting down and using Rhine by this, and gets down, and a deployment of Rhine is achieved. Moreover, warning is performed by the power-source off supervisory circuit 14 when an off demand of a power source occurs during a halt of a video-on-demand function. Although accounting is performed to a video on demand even when a power source is turned OFF during a halt of a video-on-demand function, turning OFF a power source accidentally during video-on-demand functional activation by emitting warning is prevented.

[0051]

[Effect of the Invention] As explained above, even when other functions are used during activation of a video-on-demand function according to claim 1 of this invention, have the effectiveness that it can view and listen to all of video software, and according to claim 5 of this invention By resuming playback from before a halt location after activation halt termination of a video-on-demand function It has the effectiveness that grasp of a program can be made easy, and while according to claims 6 and 7 of this invention getting down and controlling occupancy of Rhine, it has the effectiveness that it can prevent turning OFF a power source accidentally after halt termination.